

Appl. No. 10/799,309

Reply to Office Action of December 27, 2005

REMARKS

In the Office Action, claim 14 is objected to; claims 1-5, 9-11, 14, 20-23, 35 and 37 were rejected under 35 U.S.C. §102; claims 6-8, 12-13 and 24-25 were rejected under 35 U.S.C. §103. Claims 1, 10-14 and 37 are amended herein. Claim 2 has been cancelled without prejudice or disclaimer. Claims 15-19, 26-34 and 36 are withdrawn from consideration due to a previous restriction requirement. Applicants believe that the rejection are improper or have been overcome for at least the reasons below.

At the outset, claim 14 was objected to as allegedly being indefinite because the phrase minute relative to does not clearly describe the size of the contact layer. (See, Office Action, page 2). A contact layer formed of a metallic material such as Ti may be preliminarily formed on the side surfaces 9. With such a contact layer, it is possible to enhance the performance of contact between the n-type semiconductor layer 6 and the transparent electrode 4, and the light-emitting diode 1 can be made to be a light-emitting device with a further higher reliability. (See, Specification, page 22, lines 3-7). Additional support for the amendments can be found, for example, in Fig. 2, where the size of the contact layer formed on the side surfaces 9 is shown to be less than the size of the light output surface 5. In response, Applicants have amended claim 14 to more clearly define the invention and further believe that the objection has been overcome.

In the Office Action, claims 1-5, 9 and 37 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,900,473 to Yoshitake et al. ("Yoshitake"). Of the pending claims at issue, claims 1, 3 and 9 are the sole independent claims. Applicants also note that claim 37 has been amended to correct the dependency to claim 6. Amended claim 1 recites a light-emitting device including a light-emitting device main body having a light output surface and transferred, and a transparent electrode formed in a size larger than a size of the light output surface so as to cover the light output surface and connected directly to a whole area of the light output surface, wherein the transparent electrode provides direct connection between a wiring for supplying electric power to the light-emitting device main body, and wherein the wiring is formed outside the region of the light output surface. In the light-emitting apparatus as described above, the wiring layer is preferably formed outside the region of the light output surface. (See, Specification, page 10, lines 16-21). With the wiring layer formed outside the region of the light output surface, it is possible to reduce the amount of light shielded by the

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wiring layer, of the light emitted from the light-emitting device, to enhance light output efficiency, and to perform an image display with good display characteristics. (See, Specification, page 10, lines 16-21).

Claim 3 recites, at least in part wherein the transparent electrode is connected directly to a whole area of the light output surface. Claim 9 recites, at least in part, a transparent electrode formed in a size larger than a size of the light output surface so as to cover the light output surface and connected directly to a whole area of the light output surface.

Yoshitake generally relates to a semiconductor light emitting device having a multilayer structure including a light output surface (i.e., active layer 13), a cladding layer 14 having conical protrusions 20 which is formed on the light output surface, a contact layer 16 formed on the conical protrusions of the cladding layer, and a transparent electrode 17 formed on top of the contact layer 16. (See, Yoshitake, col. 3, lines 6-39 and Fig. 2).

Applicants believe that Yoshitake is distinguishable from claims 1, 3 and 9 for a number of reasons. For example, Yoshitake provides only for an *indirect* connection between the transparent electrode 17 and the pad electrode 23 (i.e., a current block layer 21 and a GaAs layer 22), in contrast to the claimed invention where the transparent electrode provides *direct* connection between a wiring for supplying electric power to the light-emitting device main body. (See also, Fig. 24A). Moreover, with regard to claim 1, Yoshitake does not disclose wherein the wiring is formed outside the region of the light output surface. Indeed, Yoshitake discloses that the wiring 23 is formed on top of (albeit indirectly) of the light emitting surface 13, as discussed above. Also, the wiring or pad electrode 23 is formed on top of the light output surface (i.e., inside the region of the light output surface). Therefore, Yoshitake does not anticipate claims 1, 3, 9 and dependents thereof for at least these reasons.

Accordingly, Applicants respectfully request that the 35 U.S.C. §102(e) rejections of claims 1-5, 9 and 37 be withdrawn.

In the Office Action, claim 10-11, 14, 20-23 and 35 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,905,907 to Konuma et al. ("Konuma"). Applicants believe that the anticipation rejection should be withdrawn as set forth below.

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Of the pending claims at issue, claims 10, 14, 20 and 35 are the sole independent claims. Independent claim 10, as amended, recites a *semiconductor* light-emitting apparatus including a plurality of light-emitting device main bodies each having a light output surface and transferred, and a transparent electrode formed to be larger in size than the light output surfaces so as to cover the light output surfaces and connected directly to a whole areas of the light output surfaces.

Independent claim 14, as amended, relates to an image display apparatus comprising an image display surface formed by arranging a plurality of light-emitting devices on an apparatus substrate, each of the light-emitting devices comprising a light-emitting device main body having a light output surface and transferred, and a transparent electrode formed in a size larger than a size of the light output surface so as to cover the light output surface and connected to whole area of the light output surface through a contact layer, wherein *a size of the contact layer is less than the size of the light output surface*.

Independent claim 20 recites a light-emitting apparatus including a light-emitting device comprising a light-emitting device main body having a light output surface and transferred, and a contact metal formed on the light output surface; a wiring layer formed outside the region of the light output surface; and a transparent electrode so formed as to cover the contact metal and the wiring layer.

Independent claim 35 relates to an image display apparatus comprising an image display surface formed by arranging a plurality of light-emitting apparatuses on an apparatus substrate, each of the light-emitting apparatuses comprising a plurality of light-emitting devices each of which comprises a light-emitting device main body having light output surface and transferred, and a contact metal formed on the light output surface; a wiring layer formed outside the regions of the light output surfaces; and a transparent electrode so formed as to cover the contact metals and the wiring layer, wherein *a size of the contact metal is less than a size of the light output surface*.

The amendments are supported in the specification at, for example, page 4, lines 1-8. Accordingly, Applicants' claimed invention provides for increased area of connection between the transparent electrode and the light-emitting device main body even as the light-emitting

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device, and its corresponding light output surface, becomes more minute in size. See Specification, page 4, lines 8-13.

Applicants respectfully submit that the cited art fails to disclose the invention as claimed in claims 10, 14, 20 and 35. For example, nowhere does the Konuma reference discuss a light-emitting device main body with a light output surface where the transparent electrode is connected to the whole area of the light output surface through a contact layer, *where a size of the contact layer is less than the size of the light output surface* as recited in claims 14 and 35. In contrast, it is clear that Konuma provides that the contact layer 234 is much larger than the light output surface 233. (See e.g., Konuma, Fig. 2B). Moreover, Konuma does not disclose a *semiconductor* light-emitting apparatus, as recited in amended claim 10. Rather, Konuma appears to only disclose an organic light emitting device. (See e.g., Konuma, col. 2, lines 65-67). Regarding amended independent claim 20, the Konuma reference fails to disclose a transparent electrode so formed as to cover *and directly contact* both the contact metal and the wiring layer. Instead, Konuma discloses a transparent electrode 235 that covers and contacts only the contact metal 234. (See Konuma, Figure 2B and 9). Indeed, the wiring 906 as shown in Fig. 9B does not contact the contact layer (as best shown in Fig. 2B).

Applicants' claimed features are essential to securely achieving electrical connection between the contact metal and the wiring layer. (See Specification, page 10, lines 10-11). Additionally, because the transparent electrode makes it unnecessary to form the wiring layer in contact with the contact metal, it is also possible to lower the positioning accuracy in forming the wiring layer and to enhance operating efficiency. (See Specification, page 10, lines 11-13).

Based on at least these differences between the Konuma reference and the claimed invention, Applicants believe that the cited art is distinguishable from the claimed invention. Therefore, Applicants respectfully submit that the cited art fails to anticipate the claimed invention.

Accordingly, Applicants request that the anticipation rejection of claims 10-11, 14, 20-23 and 35 be withdrawn.

In the Office Action, claims 6-8 were rejected under 35 U.S.C. §103(a) in view of Yoshitake and U.S. Patent No. 5,454,716 to Yashiki et al. ("Yashiki"). Thus, the Patent Office relies primarily on Yoshitake and further relies on Yashiki to remedy the deficiencies of

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Yoshitake. Claims 6-8 depend directly or indirectly from independent claim 3 and are believed to be allowable for the reasons given above with respect to claim 3 and for the additional patentable features recited therein.

Accordingly, Applicants respectfully request that the obviousness rejection of claims 6-8 be withdrawn.

In the Office Action, claims 12-13 and 24-25 were rejected under 35 U.S.C. §103(a) in view of Konuma and Yashiki. Thus, the Patent Office relies primarily on Konuma and further relies on Yashiki to remedy the deficiencies of Konuma. Claims 12-13 and 24-25 depend from claims 10 and 20, respectively, and are believed to be allowable for the reasons given above with respect to claims 10 and 20 and for the additional patentable features recited therein.

Accordingly, Applicants respectfully request that the obviousness rejection of claims 12-13 and 24-25 be withdrawn.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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